

FORM PTO-1449
(REV. 7-80)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICEATTY. DOCKET NO.
481112.410APPLICATION NO.
09/151,409

INFORMATION DISCLOSURE STATEMENT

(Use several sheets if necessary)

APPLICANT
James B. DaleFILING DATE
September 10, 1998GROUP ART UNIT
1645

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
LL	AA	4,284,537	08/18/81	Beachey	260	6	
	AB	4,454,121	06/12/84	Beachey	424	177	
	AC	4,521,334	06/04/85	Beachey	260	112.5 R	
	AD	4,597,967	07/01/86	Beachey	424	88	
	AE	4,705,684	11/10/87	Beachey	424	88	
	AF	4,784,984	11/15/88	Yamanaka et al.	502	439	
	AG	5,124,153	06/23/92	Beachey et al.	424	93	
	AH						
	AI						
	AJ						
	AK						

FOREIGN PATENT DOCUMENTS

		DOCUMENT NUMBER	DATE	COUNTRY	TRANSLATION	
					YES	NO
LL	AL	WO 94/06421	03/31/94	PCT		
	AM					
	AN					
	AO					
	AP					

OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

LL	AQ	•	Ada, <i>Fundamental Immunology</i> , William E. Paul, M.D. (ed.), 2 nd Edition, Raven Press, New York, 1989, pp. 1010-1011.
LL	AR	•	Baird et al., "Epitopes Of Group A Streptococcal M Protein Shared With Antigens Of Articular Cartilage And Synovium," <i>The Journal Of Immunology</i> 146(9):3132-3137, 1991.
LL	AS	•	Beachey and Ofek, "Epithelial Cell Binding Of Group A Streptococci By Lipoteichoic Acid On Fimbriae Denuded Of M Protein," <i>The Journal Of Experimental Medicine</i> 143:759-771, 1976.

EXAMINER

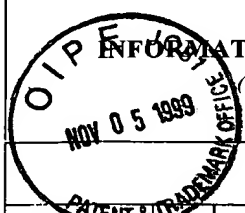


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OTHER PRIOR ART (Including Author, Title, Date, Pertinent Pages, Etc.)

LL	AC	Beachey and Seyer, "Protective And Nonprotective Epitopes Of Chemically Synthesized Peptides Of The NH ₂ -Terminal Region Of Type 6 Streptococcal M Protein," <i>The Journal Of Immunology</i> 136(6):2287-2292, 1986.
	AD	Beachey and Seyer, <i>Seminars in Infectious Disease. Volume IV Bacterial Vaccines</i> , Thieme-Stratton Inc., New York, New York, 1982, Chapter Fifty-Seven, "Primary Structure And Immuno-Chemistry Of Group A Streptococcal M Proteins," pp. 401-410.
	AE	Beachey and Stollerman, "Mediation of Cytotoxic Effects of Streptococcal M Protein by Nontype-Specific Antibody in Human Sera," <i>The Journal of Clinical Investigation</i> 52:2563-2570, 1973.
	AF	Beachey and Stollerman, "Toxic Effects Of Streptococcal M Protein On Platelets And Polymorphonuclear Leukocytes In Human Blood," <i>The Journal Of Experimental Medicine</i> 134:351-365, 1971.
	AG	Beachey et al., "Human Immune Response To Immunization With a Structurally Defined Polypeptide Fragment Of Streptococcal M Protein," <i>J. Exp. Med.</i> 150:862-877, 1979.
	AH	Beachey et al., "Immunogenicity In Animals And Man Of A Structurally Defined Polypeptide Of Streptococcal M Protein," <i>Transactions Of The Association Of American Physicians, Volume XCII</i> :pp.346-354, 1979.
	AI	Beachey et al., "Opsonic Antibodies Evoked By Hybrid Peptide Copies Of Types 5 and 24 Streptococcal M Proteins Synthesized In Tandem," <i>J. Exp. Med.</i> 163: 1451-1458, 1986.
	AJ	Beachey et al., "Peptic Digestion of Streptococcal M Protein. II. Extraction of M Antigen from Group A Streptococci With Pepsin," <i>Infection And Immunity</i> 9(5):891-896, 1974.
	AK	Beachey et al., "Primary Structure of Protective Antigens of Type 24 Streptococcal M Protein," <i>The Journal Of Biological Chemistry</i> 255(13):6284-6289, 1980.
	AL	Beachey et al., "Protective Immunogenicity And T Lymphocyte Specificity Of A Trivalent Hybrid Peptide Containing NH ₂ -Terminal Sequences Of Types 5, 6, And 24 M Proteins Synthesized In Tandem," <i>The Journal Of Experimental Medicine</i> 166:647-656, 1987.

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LL	AC	Beachey et al., "Purification And Properties Of M Protein Extracted From Group A Streptococci With Pepsin: Covalent Structure Of The Amino Terminal Region Of Type 24 M Antigen," <i>The Journal Of Experimental Medicine</i> 145:1469-1483, 1977
	AD	Beachey et al., "Repeating Covalent Structure and Protective Immunogenicity of Native and Synthetic Polypeptide Fragments of Type 24 Streptococcal M Protein," <i>The Journal Of Biological Chemistry</i> 258(21):13250-13257, 1983.
	AE	Beachey et al., "Repeating covalent structure of streptococcal M protein," <i>Proc. Natl. Acad. Sci. USA</i> 75(7):3163-3167, 1978.
	AF	Beachey et al., "Separation Of The Type Specific M Protein From Toxic Cross Reactive Antigens Of Group A Streptococci," <i>Transactions Of The Association Of American Physicians. Ninetieth Session Volume XC: pp. 390-400, 1977.</i>
	AG	Beachey et al., "Type-specific protective immunity evoked by synthetic peptide of <i>Streptococcus pyogenes</i> M Protein," <i>Nature (London)</i> 292:457-459, 1981.
	AH	Blendon et al., "Growth of <i>Listeria monocytogenes</i> in a Corn Silage Extract Medium," <i>American Journal Of Veterinary Research</i> 29(11):2237-2242, 1968.
	AI	Bricas et al., "Structure Et Synthese De La Subunite Peptide De La Paroi De Trois Bacteries Gram-Postif." <i>Peptides. Proceedings of the Eight European Peptide Symposium September 1966, Noordwijk, Neth., North-Holland Publishing Company: Amsterdam, Neth. And Interscience Publishers Division, John Wiley and Sons, Inc., New York, 1967, 286-292 (+ Biological Abstracts 50(4):Abstract No. 20361, 1936).</i>
	AJ	Bronze et al., "Protective And Heart-Cross Reactive Epitopes Located Within The NH ₂ Terminus Of Type 19 Streptococcal M Protein," <i>The Journal Of Experimental Medicine</i> 167:1849-1859, 1988.
	AK	Chou and Fasman, "Prediction of Protein Conformation," <i>Biochemistry</i> 13(2):222-245, 1974.
✓	AL	Cunningham and Beachey, "Peptic Digestion of Streptococcal M Protein. I. Effect of Digestion at Suboptimal pH upon the Biological and Immunochemical Properties of Purified M Protein Extracts," <i>Infection And Immunity</i> 9(2):244-248, 1974.

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LL	AC	Cunningham et al., "Human And Murine Antibodies Cross-Reactive With Streptococcal M Protein And Myosin Recognize The Sequence Gln-Lys-Ser-Lys-Gln In M Protein," <i>The Journal Of Immunology</i> 143(8):2677-2683, 1989.
	AD	Dale, "Group A Streptococcal Vaccines," <i>New Vaccines And New Vaccine Technology</i> 13(1):227-243, 1999.
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	AF	Dale, "Multivalent group A streptococcal vaccine designed to optimize the immunogenicity of six tandem M protein fragments," <i>Vaccine</i> 17:193-200, 1999.
	AG	Dale and Beachey, "Epitopes Of Streptococcal M Proteins Shared With Cardiac Myosin," <i>The Journal Of Experimental Medicine</i> 162:583-591, 1985.
	AH	Dale and Beachey, "Multiple, Heart-Cross-Reactive Epitopes Of Streptococcal M Proteins," <i>Journal Of Experimental Medicine</i> 161:113-122, 1985.
	AI	Dale and Beachey, "Sequence Of Myosin-Crossreactive Epitopes Of Streptococcal M Protein," <i>Journal Of Experimental Medicine</i> 164:1785-1790, 1986.
	AJ	Dale and Beachey, "Localization Of Protective Epitopes Of The Amino Terminus Of Type 5 Streptococcal M Protein," <i>The Journal Of Experimental Medicine</i> 163:1191-1202, 1986.
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↓	AL	Dale et al., "Heterogeneity Of Type-Specific And Cross-Reactive Antigenic Determinants Within A Single M Protein Of Group A Streptococci," <i>The Journal Of Experimental Medicine</i> 151:1026-1038, 1980.

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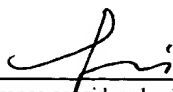
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LL	AC	Hollingshead et al., "Complete Nucleotide Sequence of Type 6 M Protein of the Group A <i>Streptococcus</i> ," <i>The Journal Of Biological Chemistry</i> 261(4):1677-1686, 1986.
	AD	Hopp and Woods, "Prediction of protein antigenic determinants from amino acid sequences," <i>Proc. Natl. Acad. Sci. USA</i> 78(6):3824-3828, 1981.
	AE	Jones et al., "Differential Effects Of Antibodies To Lyt-2 And L3 T4 On Cytolysis By Cloned, Ia-Restricted T Cells Expressing Both Proteins," <i>The Journal Of Immunology</i> 139(2):380-384, 1987.
	AF	Kang, "Studies on the Location of Intermolecular Cross-Links in Collagen. Isolation of a CNBr Peptide Containing δ -Hydroxylysine, norleucine," <i>Biochemistry</i> 11(10):1828-1835, 1972.
	AG	Kang and Gross, "Amino Acid Sequence of Cyanogen Bromide Peptides from the Amino-Terminal Region of Chick Skin Collagen," <i>Biochemistry</i> 9(4):796-804, 1970.
	AH	Kaplan et al., "Group A Streptococcal Serotypes Isolated from Patients and Sibling Contacts During the Resurgence of Rheumatic Fever in the United States in the Mid-1980s," <i>The Journal Of Infectious Diseases</i> 159(1):101-103, 1989.
	AI	Koch et al., "Purification And Structural Analysis Of Streptolysin S (SLS)," <i>Federation Proceedings</i> 42(7): p. 1810, Abstract No. 309, 1983.
	AJ	Kraus et al., "Identification Of An Epitope Of Type 1 Streptococcal M Protein That Is Shared With A 43-kDa Protein Of Human Myocardium And Renal Glomeruli," <i>The Journal Of Immunology</i> 145(12):4089-4093, 1990.
	AK	Kraus et al., "Sequence And Type-Specific Immunogenicity Of The Amino-Terminal Region Of Type 1 Streptococcal M Protein," <i>The Journal Of Immunology</i> 139(9):3084-3090, 1987.
✓	AL	Lancefield, "Persistence Of Type-Specific Antibodies In Man Following Infection With Group A Streptococci," <i>J. Exp. Med.</i> 110:271-292, 1959.

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LL	AC	Laver et al., "Antigenic drift in type A influenza virus: Peptide mapping and antigenic analysis of A/PR/8/34 (HON1) variants selected with monoclonal antibodies," <i>Proc. Natl. Acad. Sci. USA</i> 76(3):1425-1429, 1979.
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	AE	Manjula and Fischetti, "Tropomyosin-Like Seven Residue Periodicity In Three Immunologically Distinct Streptococcal M Proteins And Its Implications For The Antiphagocytic Property Of The Molecule," <i>J. Exp. Med.</i> 151:695-708, 1980.
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	AI	Phillips, Jr. et al., "Streptococcal M protein: α -Helical coiled-coil structure and arrangement on the cell surface," <i>Proc. Natl. Acad. Sci. USA</i> 78(8):4689-4693, 1981.
	AJ	Podbielski et al., "Application of the polymerase chain reaction to study the M protein(-like) gene family in beta-hemolytic streptococci," <i>Med. Microbiol. Immunol.</i> 180:213-227, 1991.
	AK	Rijn et al., "Group A Streptococcal Antigens Cross-Reactive With Myocardium," <i>The Journal of Experimental Medicine</i> 146:579-599, 1977.
✓	AL	Robbins et al., " <i>Streptococcus pyogenes</i> Type 12 M Protein Gene Regulation by Upstream Sequences," <i>Journal Of Bacteriology</i> 169(12):5633-5640, 1987.

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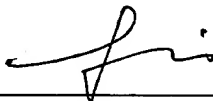
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LL	AC	Sargent et al., "Sequence Of Protective Epitopes Of Streptococcal M Proteins Shared With Cardiac Sarcolemmal Membranes," <i>The Journal Of Immunology</i> 139(4):1285-1290, 1987.
	AD	Seyer and Kang, "Covalent Structure of Collagen: Amino Acid Sequence of Cyanogen Bromide Peptides from the Amino-Terminal Segment of Type III Collagen of Human Liver," <i>Biochemistry</i> 16(6):1158-1164, 1977.
	AE	Seyer et al., "Primary Structural Similarities Between Types 5 And 24 M Proteins Of Streptococcus pyogenes," <i>Biochemical And Biophysical Research Communications</i> 92(2):546-553, 1980.
	AF	Smithies et al., "Quantitative Procedures for Use with the Edman-Begg Sequenator. Partial Sequences of Two Unusual Immunoglobulin Light Chains, Rzf and Sac," <i>Biochemistry</i> 10(26):4912-4921, 1971.
	AG	Vashishtha et al., Reactivity of Antisera to Peptides Corresponding to the C-repeat Region of Streptococcal M Protein with Mammalian Coiled-Coil Proteins," <i>Abstracts Of The 91st General Meeting of the Society for Microbiology 1991</i> :p. 129, Abstract No. E-66, 1991
	AH	Weigent et al., "Induction of Human Gamma Interferon by Structurally Defined Polypeptide Fragments of Group A Streptococcal M Protein," <i>Infection And Immunity</i> 43(1):122-126, 1984.
	AI	Wistedt et al., "Identification of a plasminogen-binding motif in PAM, a bacterial surface protein," <i>Molecular Microbiology</i> 18(3): 569-578, 1995.
	AJ	International Search Report, PCT Patent Application No. PCT/US98/19100, February 24, 1999.
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